ACC.15
TCT@ACC-i2 | innovation in intervention

A1237
JACC March 17, 2015
Volume 65, Issue 10S

Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

USING 4D ECHOCARDIOGRAPHY IMAGING TO EVALUATE THE EFFECT OF STROKE VOLUME ON MYOCARDIAL STRAIN

Poster Contributions
Poster Hall B1
Sunday, March 15, 2015, 9:45 a.m.-10:30 a.m.

Session Title: Non Invasive Imaging: Strain Imaging by Echocardiography
Abstract Category: 17. Non Invasive Imaging: Echo
Presentation Number: 1174-051

Authors: *David Sahn, Priyanka Mathur, Hao Chuan Lei, Katie Hastie, Gabriella Farland, Muhammad Ashraf, Cole Streiff, Meihua Zhu, Oregon Health & Science University, Portland, OR, USA*

Background: The implicative relationship between stroke volume (SV) vs. strain is said to be a positive correlation. However, no formal studies have been completed to show this relationship. The goal of this project is to formally define the relationship between SV and strain by 4D echocardiography.

Methods: A pulsatile pump apparatus was used to direct water through the phantom heart with a constant compaction (10 mm), constant rotation (5 degrees) and varying SVs (20-80ml) to simulate physiologically accurate cardiac motion. A latex balloon was sutured into the left ventricle of 8 pig hearts. The model was submerged into a torsion tank with water where the apex was fixed on a rotating plate, simulating cardiac rotation. Using Toshiba PST-25SX transducer echocardiographic images were taken and analyzed using UltraExtend Advanced Cardiology Package to calculate longitudinal strain (LS) and circumferential strain (CS).

Results: The results show a positive correlation between global LS and SV (R^2=0.907; p<0.001). Similarly, the results conclude a positive correlation between global CS and SV (R^2=0.8641; p<0.001).

Conclusion: The positive correlation between global LS, CS and SV was detected well by analysis of 3D echo loops.